

A RELATIVE FORM OF SERRE'S POLYNOMIAL INVARIANTS THEOREM

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ABSTRACT. Let k be a field and V a f.d. k -vector space with S the algebra of polynomial functions on V , i.e., the polynomial algebra $k[x_1, \dots, x_n]$. Then for each subgroup $W \subset GL(k, V)$, there is the subalgebra R of S of W -invariant polynomials. Serre, 1966, showed that if W is finite and generated by reflections (elements w with $\text{rk}(w - Id) = 1$), then R is again a polynomial algebra, if the order $|W|$ is a unit in k . This remains one of the most useful theorems characterizing the structure of R . Dwyer and Wilkerson have recently proved a relative form of Serre's theorem that avoids the restriction on $|W|$ in some useful cases.